U.S. ENVIRONMENTAL PROTECTION AGENCY, REGION II
Emergency and Remedial Response Division
290 Broadway, 18th Floor
New York, New York 10007-1866

MEMORANDUM

TO: Betsy Donovan
Supinderjit Kaur

FROM: Michael Sivak

DATE: July 5, 2018

RE: Rolling Knolls Landfill Superfund Site Baseline Human Health Risk Assessment Update

---

The purpose of this memorandum is to update components of the Baseline Human Health Risk Assessment (BHHRA) that was conducted for the Rolling Knolls Landfill Superfund site. The BHHRA was completed by CDM Smith for EPA in June 2014. This report was developed using exposure information identified at the time to represent reasonable maximum exposure (RME) scenarios that reflected both current and potential future uses of the site, as well as incorporate current toxicological information on the contaminants of potential concern. This memorandum specifically addresses three components of the BHHRA: (1) exposure frequency, (2) toxicity information and (3) lead.

During the development of the BHHRA, toxicity information was identified following EPA's hierarchy of sources, including IRIS, NCEA, and appropriate Tier 3 values. Additionally, an exposure frequency of 143 days/year for the adolescent and adult trespasser was selected to represent the RME scenario. The value of 143 day/year accounts for exposure 5 times/week during the 13 weeks of summer and 3 times/week during the 26 weeks of spring and fall. The BHHRA used this toxicity information and these exposure frequencies to estimate risk to the adolescent and adult trespasser to the landfill, and concluded that the noncancer hazard index for the adolescent trespasser was 5, while the noncancer hazard index for the adult trespasser was 4. Both of these hazard estimates exceed EPA's acceptable level of less than or equal to 1. Cancer risks for these populations were below or within EPA's acceptable level of 1×10^{-6} to 1×10^{-4}.

Discussions about the potential for exposure to trespassers throughout the landfill area were initiated during the development of the Feasibility Study (FS), after the BHHRA was approved by EPA. These discussions focused on the limited accessibility to the landfill, the lack of established trails and walking paths, and the dense vegetation that is common throughout the landfill area. During the effort to develop Alternate Remediation Standards (ARS) that would be used to assess cleanup alternatives in the FS, the exposure frequency of trespassers to the landfill was reevaluated, with these characteristics of the site in mind. After careful consideration of these factors, EPA concluded that the exposure frequency of 143 days/years likely overestimated the RME scenario and identified a value of 84 days/year as an exposure frequency that more accurately represented the RME scenario. This value, which was selected as part of the process to develop ARS for the site, is based on the following:

- When school is out for the summer months (June, July and August), exposure would occur 3 days per week;

- During the spring (April and May) and fall (September, October and November), exposure would occur 2 days per week;
- For those months when the average high temperatures are less than 50 degrees (January, February, March and December), exposure would not occur.

These exposures are presented in the following table:

Month	# Days per Month	Weekly Exposure Frequency (days/week)	Monthly Exposure Frequency (days/month)
April	30	2	9
May	31	2	9
June	30	3	13
July	31	3	13
August	31	3	13
September	30	2	9
October	31	2	9
November	30	2	9
		Total Exposure Frequency (days/year)	84

During the development of the ARS, toxicity values were also re-examined. Toxicity information for all contaminants of potential concern (COPCs) that were quantitatively evaluated in the BHHRA was verified to ensure that the ARS were developed using up-to-date information. This review identified that toxicity information for several COPCs had been updated since the 2014 BHHRA was approved. Specifically, the toxicity information for polycyclic aromatic hydrocarbons (PAHs), as well as a few other COPCs, had been updated in IRIS and from other sources. The following table shows the updated toxicity information used to develop the ARS:

Chemical	RfD (mg/kg-day)	Absorbed RfD (mg/kg-day)	SF $(mg/kg\text{-}day)^{-1}$	Absorbed SF $(mg/kg\text{-}day)^{-1}$	Source
Benzo(a)pyrene	3E-04	3E-04	1E+00	1E+00	IRIS
Benzo(a)anthracene	NA	NA	1E-01	1E-01	USEPA
Benzo(b)fluoranthene	NA	NA	1E-01	1E-01	USEPA
Benzo(k)fluoranthene	NA	NA	1E-02	1E-02	USEPA
Chrysene	NA	NA	1E-03	1E-03	USEPA
Dibenz(a,h)anthracene	NA	NA	1E00	1E00	USEPA
Indeno(1,2,3-cd)pyrene	NA	NA	1E-01	1E-01	USEPA
PCB TEQ	NA	NA	1.3E+05	1.3E+05	CalEPA
2,3,7,8-TCDD	NA	NA	1.3E+05	1.3E+05	CalEPA
4,4'-DDT	3E-05	3E-05	NC	NC	PPRTV-S

NA: No toxicity value is available.
NC: No change from the BHHRA.
PPRTV-S: Provisional Peer Reviewed Toxicity Value - Screening

Since the exposure frequency for the adolescent and adult trespassers was revised to 84 days/year from 143 days/year and toxicity information was updated for certain COPCs, the noncancer hazards for these were recalculated to assess if the hazards remained above EPA's acceptable level. The noncancer

hazard index for the adolescent trespasser was estimated to be 3, while the value for the adult trespasser was estimated to be 2. Both of these values still exceed EPA's acceptable level.

Finally, lead concentrations at the site were reevaluated. In 2016, EPA released a directive focusing on lead. In OLEM Directive 9200.2-167, "Updated Scientific Considerations for Lead in Soil Cleanups", blood lead levels less than 10 ug/dl were identified as associated with health concerns. In response to this directive, Region 2 developed a policy to evaluate how lead is assessed at sites. One outcome of this updated approach is to review data to identify if any soil sample results exceed 200 mg/kg. This is a change from the approach used in the 2014 BHHRA, which used a value of 400 mg/kg to identify areas that require further review. Lead was identified as requiring further action during the 2014 BHHRA, and this remains a valid conclusion after the review using the revised screening level of 200 mg/kg.

In summary, this memorandum reviewed three components of the 2014 BHHRA. This review, which included updates to exposure frequency, toxicity information, and lead, concluded that the results of the 2014 BHHRA remain valid, that actionable risk is present at the Rolling Knolls Landfill Superfund Site.

/MAS